

CLAIMS

1. A diaphragm clutch mechanism for a motor vehicle engine, the said mechanism (1) including at least one friction liner (3) which is adapted to be gripped by means of an annular diaphragm (10) between a
5 reaction plate (5) and a pressure plate (7), a cover plate (12) fixed to the reaction plate (5) and coupled to the pressure plate (7) for rotation with the latter while being also movable in axial straight line motion with respect to the reaction plate (5), and assistance means (20) consisting of at least one Belleville ring (B) which co-operates with the
10 diaphragm (10) so that the load exerted by the latter on the pressure plate (7) is substantially constant regardless of the degree of wear in the friction liner (3) when the clutch mechanism (1) is in an engaged position, characterised in that the Belleville assistance ring (B) bears on the diaphragm (10) or cover plate (12) which constitutes a forward
15 abutment, and in that the Belleville assistance ring (B) bears on a rear abutment carried by the cover plate (12) so as to be under stress at least when the clutch mechanism (1) is in a disengaged position.
2. A diaphragm clutch mechanism according to Claim 1, characterised in that, when the clutch mechanism (1) is in an engaged position with
20 a new friction liner (3), the Belleville assistance ring (B) applies a light or zero force on the diaphragm (10).
3. A diaphragm clutch mechanism according to Claim 1 or Claim 2, characterised in that, when the clutch mechanism (1) is in a
25 disengaged position, the Belleville assistance ring (B) applies no force on the diaphragm (10).
4. A clutch mechanism according to any one of the preceding Claims, characterised in that it includes two centring means selected from three possible centring means, namely means for centring as between
30 the cover plate (12) and diaphragm (10), or between the diaphragm (10) and the Belleville assistance ring (B), or between the cover plate (12) and the Belleville assistance ring (B).
5. A diaphragm clutch mechanism according to any one of the preceding Claims, characterised in that the Belleville assistance ring (B) is mounted between the pressure plate (7) and the cover plate (12),
35 and in that the Belleville assistance ring (B) has radially external lugs (24) which are bent back to define hooks (25) that surround the peripheral portion (10a) of the diaphragm with a clearance when the clutch mechanism (1) is in a disengaged position.

6. A diaphragm clutch mechanism according to Claim 5, characterised in that the Belleville assistance ring (B) is mounted between the pressure plate (7) and the diaphragm (10).

5 7. A diaphragm clutch mechanism according to any one of the preceding Claims, characterised in that the Belleville assistance ring (B) is mounted on the outside of the cover plate (12), in that it includes radially external lugs defining hooks (45) that extend through apertures (47) formed through the cover plate, so as to come into engagement with the diaphragm (10), and in that the Belleville assistance ring (B)
10 engages on the external wall of the cover plate (12) through an abutment bead (48).

8. A diaphragm clutch mechanism according to Claims 5 to 7, characterised in that the Belleville assistance ring (B) is frustoconical in form with a minor base and a major base, in that the minor base is
15 permanent abutment on the diaphragm (10) at points situated in the vicinity of the points of articulation of the diaphragm (10), and in that the major base bears on the internal wall of the cover plate (12) when the clutch mechanism is in a disengaged position.

9. A diaphragm clutch mechanism according to Claim 8, characterised
20 in that the points of articulation of the diaphragm (10) which enable its peripheral portion (10a) to constitute a Belleville ring (B) consist of a bead (29) projecting from the internal wall of the cover plate (12), together with elastic lugs (30) fixed with respect to the cover plate (12), the said points of articulation being situated on either side of the
25 cover plate (12).

10. A diaphragm clutch mechanism according to any one of Claims 1 to 3, characterised in that the Belleville assistance ring (B) is mounted between the pressure plate (7) and cover plate (12), in that the Belleville assistance ring (B) includes radially external lugs (35) which
30 are bent back at substantially 90° and each of which terminates in a driving foot (37), and in that the said external lugs (35) are adapted to be lodged within notches (40) formed at the periphery of the diaphragm (10).

11. A diaphragm clutch mechanism according to Claim 10,
35 characterised in that the external lugs (35) of the Belleville assistance ring (B) terminate in a T-shaped end, the base of the T constituting the driving foot (37).

12. A diaphragm clutch mechanism according to Claim 10 or Claim 11, characterised in that the external lugs (35) of the Belleville

assistance ring (B) are fitted by elastic deformation within notches (40) of the diaphragm (10).

13. A diaphragm clutch mechanism according to Claim 12, characterised in that the external lugs (35) of the Belleville assistance ring (B) are engaged in notches (40) of the diaphragm (10) after relative rotation between the Belleville assistance ring (B) and diaphragm (10).

14. A diaphragm clutch mechanism according to any one of Claims 10 to 13, characterised in that the Belleville assistance ring (B) includes radially internal lugs (39) which are bent back outwards in a direction away from that of the radially external lugs (35), and in that the said internal lugs (39) are engaged freely within oblong radial apertures (42) formed through the cover plate (12), with the said internal lugs (39) centring the Belleville assistance ring (B) with respect to the cover plate.

15. A diaphragm clutch mechanism according to Claim 14, characterised in that the diaphragm (10) is centred with respect to the cover plate (12) by means of articulation lugs (30) of the diaphragm (10) which are fixed to the cover plate (12) on the one hand, and an abutment bead (29) of the cover plate (12) on the other hand.

16. A diaphragm clutch mechanism according to Claim 7, characterised in that the hooks (45) adapted to be bent back about the peripheral portion of the diaphragm (10) define a clearance when the clutch mechanism (1) is in a disengaged position.

17. A diaphragm clutch mechanism according to Claim 7, characterised in that it includes retaining means for preventing the hooks (45) of the Belleville assistance ring (B) from opening under the effect of centrifugal force due to rotation of the cover plate (12).

18. A diaphragm clutch mechanism according to Claim 17, characterised in that the said retaining means consist of external fingers (52) which are supported by the hooks (45) of the Belleville assistance ring (B), and which come into engagement on the internal wall of the apertures (47) and the cover plate (12) through which the hooks (45) pass.

19. A diaphragm clutch mechanism according to any one of Claims 16 to 18, characterised in that the forward abutment consists of an external wall of the cover plate (12), or is fixed to the said external wall, and in that the rear abutment on which the Belleville assistance

ring (B) bears when the clutch mechanism (1) is in a disengaged position, consists of an internal wall of the cover plate (12) or is fixed with respect to the said internal wall.

20. A diaphragm clutch mechanism according to Claim 19,
5 characterised in that the Belleville assistance ring (B) is provided with radially external lugs (55) which are in cooperation with the rear abutment of the cover plate (12).

21. A diaphragm clutch mechanism according to any one of Claims
10 16 to 20, characterised in that it includes means for centring the Belleville assistance ring (B) and cover plate (12), the said means consisting of radially internal lugs (59) of the Belleville assistance ring (B), the said lugs (59) being bent back so as to penetrate freely into apertures (60) in the cover plate (12).

22. A diaphragm clutch mechanism according to any one of Claims 1
15 to 4, characterised in that the Belleville assistance ring (B) is provided with eyelets (64) spaced apart over its periphery and constituting seatings for radial lugs (66) which are extensions of the periphery of the diaphragm (10).

23. A diaphragm clutch mechanism according to Claim 22,
20 characterised in that each of the eyelets (64) is formed in a substantially axial extension (62) of the Belleville assistance ring (B).

24. A diaphragm clutch mechanism according to any one of the
25 preceding Claims, characterised in that the Belleville assistance ring (B) bears on the rear abutment carried by the cover plate (12) regardless of the position of the clutch mechanism (1).

25. A diaphragm clutch mechanism according to Claim 24,
characterised in that the Belleville assistance ring (B) bears on the rear abutment through abutment elements (68; 72) which couple the Belleville assistance ring (B) with the cover plate (12).

30 26. A diaphragm clutch mechanism according to Claim 25, characterised in that each abutment element comprises an elastic tongue (68) having one end (68A) fixed on the cover plate (12) and a free end (68B) in elastic engagement on the Belleville assistance ring (B).

35 27. A diaphragm clutch mechanism according to Claim 26, characterised in that the elastic tongues (68) extend through an aperture (70) in the cover plate (12), between an external wall (12b) and an internal wall (12a) of the cover plate (12).

28. A diaphragm clutch mechanism according to Claim 25, characterised in that the abutment elements (72) are formed integrally with the Belleville assistance ring (B).

5 29. A diaphragm clutch mechanism according to Claim 28, characterised in that each of the abutment elements comprises a lug constituting an external extension (72) of the Belleville assistance ring (B), having an end (72A) connecting it with the Belleville assistance ring (B) and at least one free end (72B) in elastic engagement on the Belleville assistance ring (B).

10 30. A diaphragm clutch mechanism according to Claim 29, characterised in that the external extension (72) has a free end (72B) which is substantially in radial alignment with the connecting end (72A).

15 31. A diaphragm clutch mechanism according to Claim 29, characterised in that the external extension (72) has a free end (72B) offset circumferentially radially with respect to the connecting end (72A).

20 32. A diaphragm clutch mechanism according to Claim 29, characterised in that the external extension (72) is generally T-shaped and has two free ends (72B1, 72B2) which are offset circumferentially in opposite directions with respect to the connecting end (72A).